

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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UMICORE AG & CO. KG,  
Petitioner,

v.

BASF CORPORATION,  
Patent Owner.

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Case IPR2015-01121  
Patent 7,601,662

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Before CHRISTOPHER L. CRUMBLEY, JO-ANNE M. KOKOSKI, and  
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318 and 37 C.F.R. § 42.73*

## I. INTRODUCTION

Umicore AG & Co. KG (“Petitioner”) filed a Petition seeking *inter partes* review of claims 1–24, 30, and 32–50 of U.S. Patent No. 7,601,662 B2 (Ex. 1001, “the ’662 patent”), as amended by *Ex parte* Reexamination Certificate No. US 7,601,662 C1 (“Reexam. Cert.”). Paper 1 (“Pet.”). BASF Corporation (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 7. On October 29, 2015, we instituted an *inter partes* review of claims 1–8, 12–24, 30, and 32–50 as discussed below. Paper 8 (“Dec. on Inst.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 24, “PO Resp.”), and Petitioner filed a Reply (Paper 36, “Reply”). An oral hearing was held on July 28, 2016, and a transcript of the hearing has been entered into the record of the proceeding as Paper 52 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–8, 12–24, 30, and 32–50 are unpatentable.

## II. BACKGROUND

### A. *Related Proceedings*

Petitioner identifies pending *inter partes* review Case IPR2015-01125, also pertaining to the ’662 patent. Pet. 1. In addition to IPR2015-01125, Patent Owner identifies pending *inter partes* review Cases IPR2015-01123 and -01124, pertaining to U.S. Patent No. 8,404,203 B2, which issued from a divisional of the application that issued as the ’662 patent. Paper 5, 2.

*B. The '662 Patent*

The '662 patent, titled “Copper CHA Zeolite Catalysts,” originally issued on October 13, 2009, with an *ex parte* reexamination certificate issuing on June 7, 2013. The '662 patent states that “synthetic and natural Zeolites and their use in promoting certain reactions, including the selective reduction of nitrogen oxides with ammonia in the presence of oxygen, are well known in the art,” and that “[m]etal-promoted Zeolite catalysts including, among others, iron-promoted and copper-promoted Zeolite catalysts, for the selective catalytic reduction of nitrogen oxides with ammonia are known.” Ex. 1001, 1:26–33.

The '662 patent discloses catalysts that comprise zeolites having a CHA crystal structure and include copper, which may be part of an exhaust gas treatment system. *Id.* at 1:55–61. According to the '662 patent, “novel copper chabazite catalysts are provided which exhibit improved NH<sub>3</sub> SCR of NO<sub>x</sub>.” *Id.* at 1:64–66. Several embodiments described in the '662 patent depict a catalyst comprising a zeolite having the CHA crystal structure, a specific mole ratio of silica to alumina (e.g., greater than about 15), and a specific atomic ratio of copper to aluminum (e.g., greater than about 0.25). *Id.* at 4:24–29.<sup>1</sup> The '662 patent teaches that the catalyst compositions can be disposed on a substrate, which usually comprises a honeycomb structure. *Id.* at 6:55–59. According to the Specification, the CuCHA zeolite catalysts of the '662 patent are said to have increased hydrothermal stability (i.e.,

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<sup>1</sup> For purposes of this decision, we follow the parties' convention of using “SAR” to refer to the mole ratio of silica to alumina, and “Cu/Al ratio” to refer to the atomic ratio of copper to aluminum required in the claims.

greater stability when subjected to thermal aging) as compared to other Cu-zeolite catalysts. *Id.* at 5:1–16, 5:49–52.

*C. Illustrative Claim*

Claim 1 is the only independent claim challenged, and is reproduced below:

1. A catalyst comprising:  
an aluminosilicate zeolite having the CHA crystal structure and a mole ratio of silica to alumina from about 15 to about 150 and an atomic ratio of copper to aluminum from about 0.25 to about 1, the catalyst effective to promote the reaction of ammonia with nitrogen oxides to form nitrogen and H<sub>2</sub>O selectively.

Ex. 1001, Reexam. Cert. 1:56–2:3 (annotations and emphasis omitted).

*D. References*

Petitioner relies on the following references:

Zones et al., US 6,709,644 B2, issued March 23, 2004 (“Zones,” Ex. 1004).

Maeshima et al., US 4,046,888, issued September 6, 1977 (“Maeshima,” Ex. 1002).

Patchett et al., US 2006/0039843 A1, published February 23, 2006 (“Patchett,” Ex. 1005).

*E. Reviewed Grounds of Patentability*

The Board instituted trial to review the patentability of the challenged claims on the following grounds:

References	Statutory Basis	Claims Challenged
Zones and Maeshima	§ 103	1–8 and 30
Zones, Maeshima, and Patchett	§ 103	12–24 and 32–50

### *F. Level of Ordinary Skill in the Art*

Petitioner's declarant, Dr. Lercher, testified that a person of ordinary skill in the art "would have at least a Master's degree in chemistry or a related discipline, and have knowledge of the structure and chemistry of molecular sieves like zeolites, including factors that impact their stability and activity." Ex. 1008 ("Lercher Declaration") ¶ 66. Patent Owner's declarant, Dr. Tsapatsis, stated that he agrees with the level of ordinary skill in the art advanced by Dr. Lercher. Ex. 2018 ("Tsapatsis Declaration") ¶ 22.

We credit the testimony provided by the declarants for both parties and hold that one of skill in the art would possess at least a Master's degree in chemistry or a related discipline, and have knowledge of the structure and chemistry of molecular sieves like zeolites, including factors that impact their stability and activity. This level of ordinary skill is reflected not only by the information presented by the parties, but also by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art).

## III. ANALYSIS

### *A. Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). We determine that no express claim construction is required for purposes of this Decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795,

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